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EMC TEST SYSTEMS, L.P. – An ESCO Company

E M C O

Test Site Hardware

Positioning Controller

Model 2090

Features:

- **Control for 2 Primary and 4 Auxiliary Devices**
- **SEEK & SCAN Functions**
- **Automatic Target Overrun Correction**
- **Element Saving Limit Setting**
- **Fiber Optic Control Lines**
- **IEEE-488.2 I/O Port**
- **Speed Control**



Model 2090 Positioning Controller

ETS-EMCO's Model 2090 Positioning Controller allows you to synchronize simultaneous movement of two primary ETS-EMCO devices (towers or turntables), and on/off operation of up to four auxiliary devices (LISNs, EUTs, etc.). Independent operation of primary devices can be performed manually, by either of the two front panel controls, or remotely, by a separate GPIB address for each device. Fiber optic control lines eliminate RF interference that can be conducted through traditional wire cables.

The Model 2090 is designed to maximize the features of ETS-EMCO antenna towers and turntables. See page 4 for information about retrofits to earlier ETS-EMCO models and non-ETS products.

Functions

The front panel design of the Model 2090 features a user-friendly interface which simplifies device control and clearly communicates primary device movement to the operator. Two separate sets of controls (Device One and Device Two), each with identical displays and functions, are included. Other front panel features include four auxiliary control switches and the Model 2090 power switch.

A number of useful primary device commands can be performed by the operator. The SEEK function enables the user to reposition a device to a new target location and the SCAN command initiates cyclic movement of a device. The CONFIG and LIMIT functions enable the user to program operational parameters and upper/lower or clockwise/counterclockwise limits for each device. The POSITION and STEP functions work together to control tower cross boom and/or turntable positioning. Expanded details of these functions are offered below.

SEEK & SCAN

SEEK allows a target location to be entered to redirect the device from its current location. Target locations can be automatically incremented/decremented by a given value. The SEEK command is available only through the GPIB. All other functions can be performed from both the GPIB and the front panel. The SCAN key initiates cyclic movement of a device between pre-programmed limits. A cycle is defined as movement from the lower/counterclockwise limit to the upper/clockwise limit and back to the lower/counterclockwise limit. The total number of cycles is programmable from 1 to 999 or an entry of "000" causes the device to scan continuously.

CONFIG & LIMIT

The CONFIG (Configuration of Parameters) and LIMIT keys work together for system set up. The CONFIG function enables the operator to select six operational parameters for both primary devices.

The LIMIT keys allow the operator to set upper and lower, or clockwise and counterclockwise limits. The user simply sets the limit by pressing the INCRM or DECRM keys until the desired limit is shown on the display and then selects the ENTER key. To verify or set the current position of a device under control, the user can press the CURRENT POSITION key.

POSITION & STEP

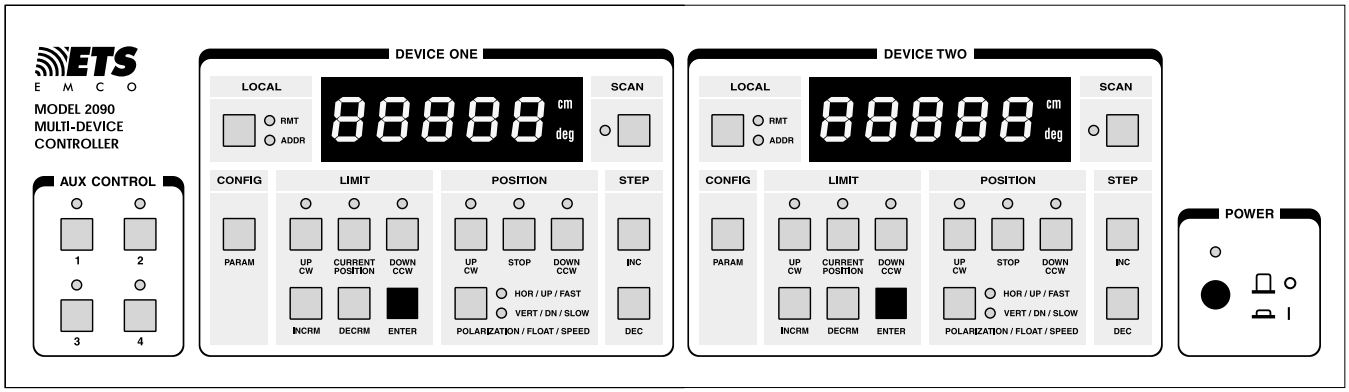
The POSITION and STEP functions work together to manually position the tower cross boom and/or turntable. Four POSITION keys and two STEP keys are available to achieve this control.

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Tel +1.512.835.4684
Fax +1.512.835.4729

FINLAND:
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Fax +358.2.8651.233

ONLINE:
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Front Panel Illustration – Model 2090 Positioning Controller

POSITION Keys

- **UP / CW**
  UP moves the tower cross boom upward.
  CW moves the turntable clockwise.

- **DOWN / CCW**
  DOWN moves the tower cross boom downward.
  CCW moves the turntable counterclockwise.

- **STOP**
  STOP ceases movement of device.

- **POLARIZATION / FLOTATION/SPEED**
  HOR / UP/ FAST
  VERT / DN / SLOW
  On a tower, pressing this button will toggle the tower cross boom between HORIZONTAL and VERTICAL polarization. On an air flotation turntable, pressing this button will toggle the UP (inflation) and DOWN (deflation) of the turntable top. On a two-speed turntable, pressing this button will toggle the speed of the turntable between FAST and SLOW. On a variable speed turntable, pressing this button will cycle the SPEED between four presets. The indicator lights will illuminate in a binary fashion to indicate the current preset speed selection i.e. first preset OFF-OFF, second preset ON-OFF, third preset OFF-ON, fourth preset ON-ON.

STEP Keys

- **INC**
  INC moves the device up or clockwise.

- **DEC**
  DEC moves the device down or counterclockwise.

The controller will move the device in the desired direction as long as the key is pressed. The device will stop when the key is released.

LOCAL/REMOTE OPERATION

The Model 2090 can be operated manually from the front panel or remotely via the GPIB port. When the Model 2090 is addressed via the GPIB port, the RMT indicator light will illuminate and the ADDR indicator will flash to show bus activity. Pressing the LOCAL function key allows you to exit the remote mode. When the optional Hand Control Unit (see Options, page 3) is used, all position changes will be recorded and displayed by the Model 2090 Controller.

AUXILIARY CONTROL

Four front panel keys are available to control auxiliary devices. While in manual mode, you can activate an auxiliary device by pressing the AUX CONTROL key that corresponds to the auxiliary device port. In remote mode, auxiliary devices can be activated by using the appropriate GPIB command. The control lines are on/off output only. In order to use these four auxiliary lines, an interface box that will perform a custom function and accept a fiber optic input, is needed. Contact ETS-EMCO Sales for details.

Features

Automatic Target Overrun Correction

The Model 2090 constantly monitors inertia-induced target overrun. If overrun on turntables or towers occurs, it is identified and tracked. Utilizing a special algorithm, the Model 2090 continually adjusts subsequent positionings to minimize overrun, allowing for proper device positioning during tests.

Element Saving Limit Setting

To prevent damage to antenna elements which may accidentally rotate into the ground plane or ceiling during polarization, the Model 2090 allows you to program two upper and two lower limit settings. These settings allow you to safely maximize antenna scan height in either horizontal or vertical polarization – especially useful with BiConiLogs™, biconicals, log periodics, and other antennas with protruding elements.

Fiber Optic Input/Output Lines

The 2090 features fiber optic control lines to eliminate conducted noise. Each primary device cable contains two fiber

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optic lines (transmit/receive). Auxiliary device lines are output only. Reliable and easy-to-use ST connectors are standard.

GPIB
The General Purpose Interface Bus (GPIB) complies with IEEE 488.1/488.2 standards. All front panel functions can be exercised using GPIB commands while in the remote mode. GPIB commands are backward compatible with ETS-EMCO Model 1050, 1060 and 1090 Controllers, simplifying upgrades to the new model. Model 1050 and 1060 commands are compatible with Hewlett Packard's Model HP 85876A Commercial Radiated EMI Measurement Software and Rohde & Schwarz Model ES-KI EMI Measurement & Evaluation Software.

Speed Control
Users whose test facilities include a two-speed turntable will find the Model 2090 positioning controller well suited to their needs. The unit's SLOW control activates the turntable's lower speed drive. The FAST control activates the turntable's higher speed drive. The controller can be used for speed-control with ETS-EMCO turntables that feature dual speeds and other brands of two-speed turntables.

Memory
All settings in the Model 2090 are saved when the unit is turned off, allowing for easy set-up when testing is interrupted and returned to later.

Precise Resolution
Display accuracy on the Model 2090 is highly precise. The unit offers position readout increments of 1 mm for towers and 0.1 degree for turntables.

Universal Power Supply
The positioning controller has a convenient built-in auto ranging feature that automatically senses supply voltage. Any AC power source input within the range of 115/230 VAC, 50/60 Hz can be used.

Rack Mounting
For convenience, the Model 2090 is standard rack width and 3U rack size.

Standard Configuration
- Controller assembly
- IEC 320 power cord
- Manual

Options
Hand Control Unit
The Hand Control Unit is designed to manually operate ETS-EMCO antenna towers and turntables. Lightweight and easy to operate, this convenient unit plugs into the motor base of the tower or turntable and enables you to perform simple manual movement of these devices. It works in tandem with ETS-EMCO's Model 2090 Controller. Changes in position location made by the Hand Control Unit will be recorded and displayed by the Model 2090 Controller. To order, specify part number 105136.

Auxiliary Control Unit
The Auxiliary Control Unit provides a means to remotely open and close contacts via fiber optic cable. These contacts can be used to remotely control power relays or other devices to automate EMC testing. Simplex fiber optic cable connects the output of the Model 2090 Aux Control to the input of the Auxiliary Control Unit. The Auxiliary Control Unit is powered by a wall-mount power supply (user-specified 115 VAC or 230 VAC at time of order).

Additional Fiber Optic Cable
Standard fiber optic cable length is 10 meters. Custom lengths are available. To order, specify part number 708029-m (10 m increments).

Fiber Optic Feedthrough
Bulkhead feedthrough consisting of a wave-guide cutoff for fiber optic cable. To order, specify part number 105120.

Rack Mount Rails
A rack mount kit can be purchased for mounting the Model 2090 in a rack. To order, specify part number 540037.

Electrical Specifications

MODEL	POWER	FUSE	BACK PANEL I/O
2090	115/230 VAC[1] 50/60 Hz	2 A 250 VAC Time Delay	8 fiber optic connectors. IEEE-488.2 connector. IEC 320 power inlet. Fuse holder.

[1] Autoselect

Physical Specifications

MODEL	WIDTH	DEPTH[2]	HEIGHT	WEIGHT
2090	43.8 cm 17.3 in	34.3 cm 13.5 in	13.3 cm 5.3 in	4.5 kg 10.0 lb

[2] Excluding handles

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Positioning Controller Upgrade Kits

Now your older ETS-EMCO tower and turntable can operate with all of the new command features available with our Model 2090 Positioning Controller. All you need is our Retrofit-Kit and a Model 2090 Controller to replace your existing EMCO Model 1050, 1060, 1060C or 1090 Controller. You'll be able to control two devices (tower or turntable) and four auxiliary devices at once, plus access the SEEK, SCAN, target overrun, and multiple limit functions. For a thorough description of all Model 2090 features and functions please turn to page one. Note: Bore Sight functions are only available with Model 2071 towers.

To install the Retrofit-Kit, the included interface box is placed in line between the tower/ turntable motor box and controller. Existing cables are used between the tower/turntable motor box and the Retrofit-Kit's interface box. Fiber optic cables are connected between the interface box and the new Model 2090 Positioning Controller.

Retrofit-Kit to replace Model 1050 or 1060 Controllers
PN # 105637

Retrofit-Kit to replace Model 1090 Controller
PN # 105797

Retrofit-Kit for non-EMCO towers/turntables
CALL FOR QUOTE

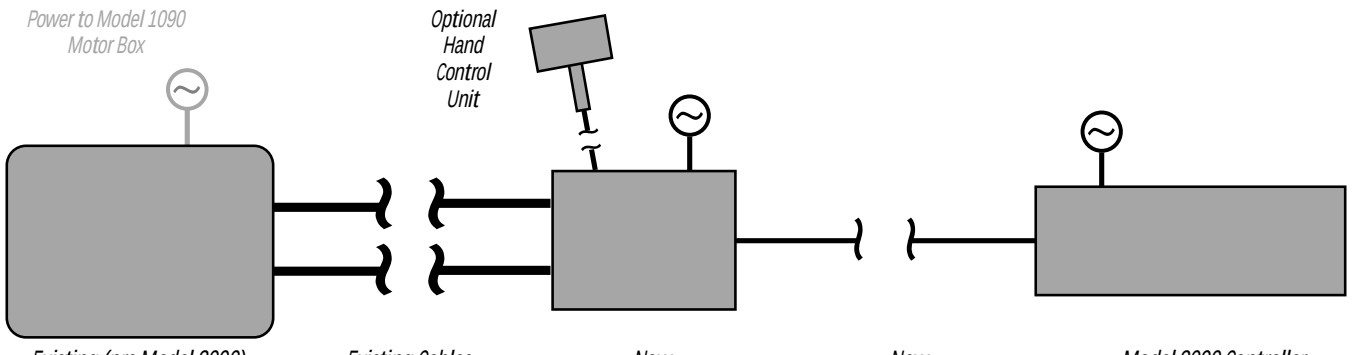
All kits consist of an interface box with power cord and a 10 meter fiber optic cable.

Options

- Custom length fiber optic cable
- Custom length wire cable
- Hand Control Unit

Specifications

MODEL	PHYSICAL				ELECTRICAL	
	WIDTH	DEPTH	HEIGHT	WEIGHT	VOLTAGE (SELECTABLE)	Hz
Retrofit-Kit for 1050, 1060	35.6 cm 14.0 in	30.5 cm 12.0 in	16.5 cm 6.5 in	11.4 kg 25.2 lb	115/230	50/60



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